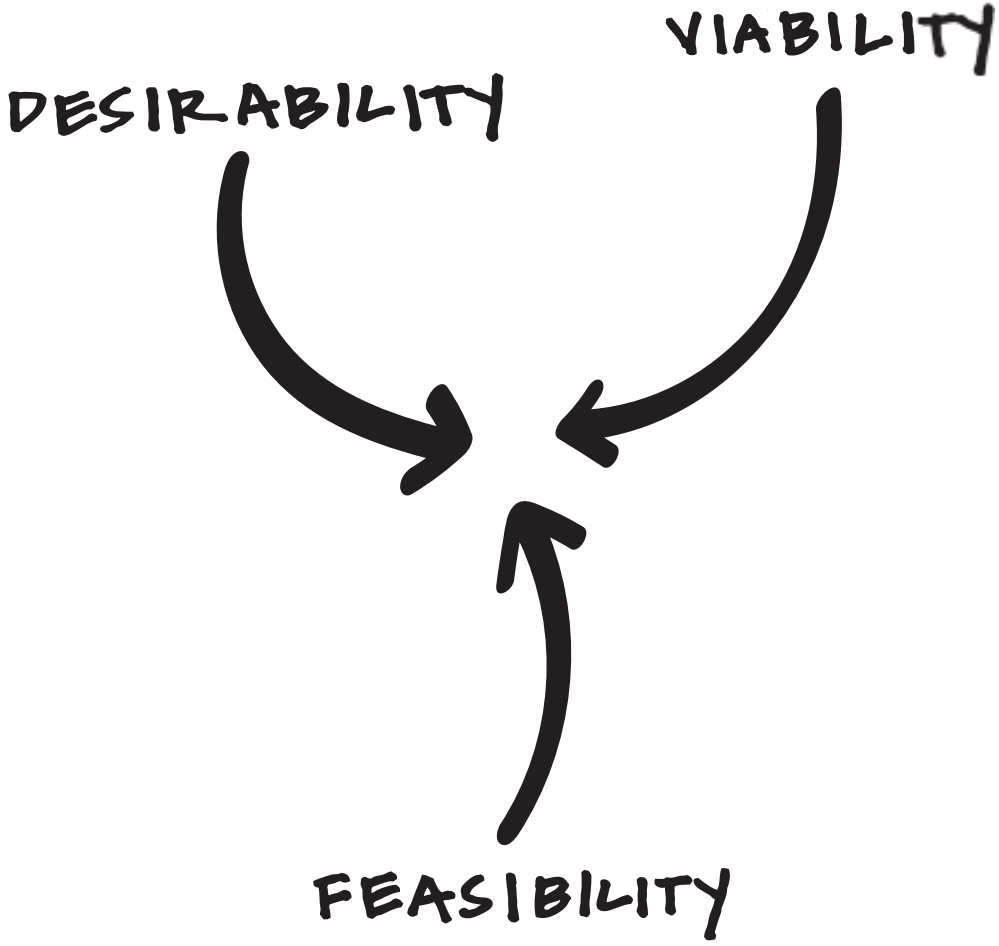
Implementing Human-Centered Design Research

ETHOS 2022

IPAs

Impact = Performance * Adoption * Scale

"**Design thinking** is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."
—Tim Brown, Executive Chair of IDEO



https://designthinking.ideo.com/

Five Shifts for Cookstoves

Project Website
Project Video
Project Deliverable

Location:
Tanzania

Client:
Global Alliance for Clean Cookstoves

Role:
Designer, Human Factors Lead, Strategist

Date:
2012

About

Clean cookstoves have the potential to improve health by reducing exposure to smoke from traditional fires and stoves, improve livelihoods through increased savings from reduction of fuel use, and benefit the environment through a decrease in emissions. Despite the significant improvements in cookstove technology in recent years, there has been too little attention paid to the habits, motivations, and aspirations of cookstover users. As a result, clean cookstove adoption in countries like Tanzania has been low.

Using an intensive human-centered design approach, IDEO.org worked with the Global Alliance for Clean Cookstoves to identify opportunities to increase demand for clean cookstoves in Tanzania and beyond. The ultimate result was a strategy document which details five user-inspired shifts, that along with initial concepts, are intended to help the cookstove industry reframe its focus from the technology to the cook.

A project of IDEO.org

https://www.lizogbu.com/portfolio_page/five-shifts-for-cookstoves/

Fundamental Behaviours.

Human-centered design identifies the fundamental elements to human behavior. Although advanced stoves are rare in Tanzania, we believe that our approach allowed us to identify behavior patterns that still apply to the future adoption of such stoves.

https://s3.amazonaws.com/ideo-org-images-production/documents/9/original/20120323_Final_Small-1.pdf

5 Shifts

1. From Acquisition to Use
2. From Stove to Fuel
3. From Status to Utility
4. From Saving Fuel to Cooking with Ease
5. From Health to Comfort

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Introducing the Field Guide

Now available for purchase and PDF download, check out the Field Guide to Human-Centered Design and start solving problems like a designer!

WHAT IS HUMAN-CENTERED DESIGN?

https://www.designkit.org/

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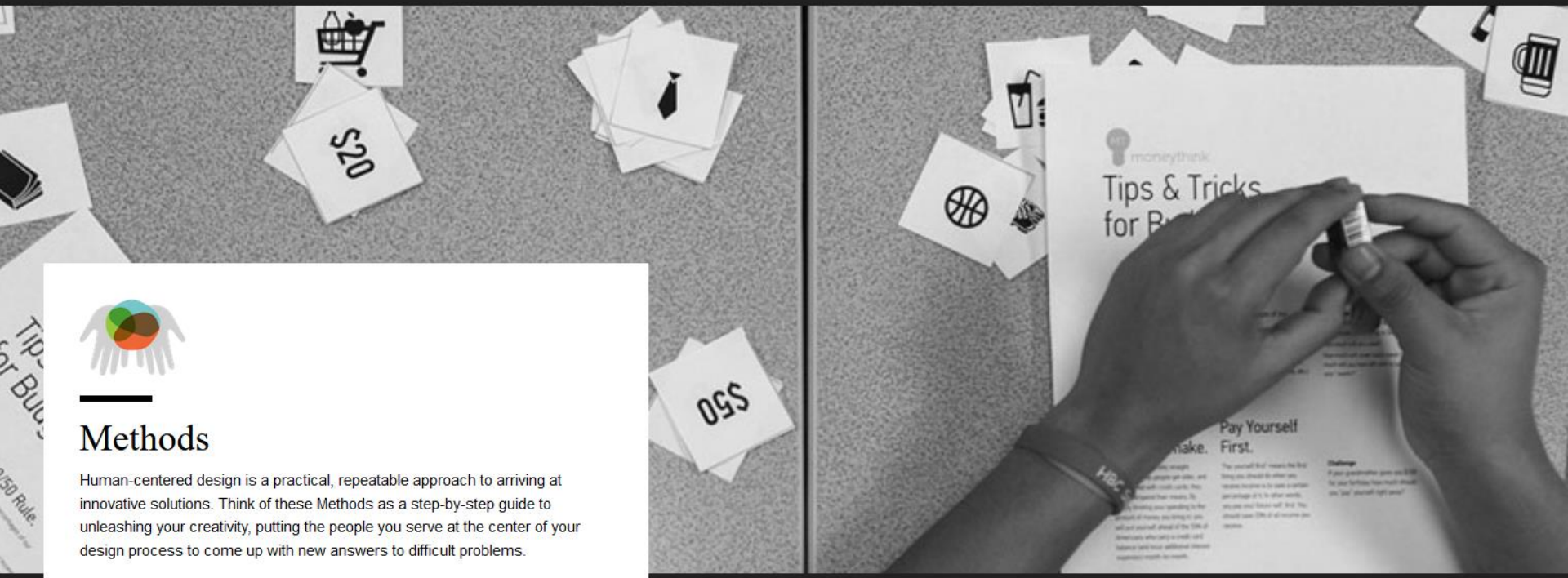

Methods

Human-centered design is a practical, repeatable approach to arriving at innovative solutions. Think of these Methods as a step-by-step guide to unleashing your creativity, putting the people you serve at the center of your design process to come up with new answers to difficult problems.

FILTER METHODS

INSPIRATION IDEATION IMPLEMENTATION BY QUESTION VIEW ALL MY METHODS

CONVERSATION STARTERS

FRAME YOUR DESIGN CHALLENGE

DEFINE YOUR AUDIENCE

https://www.designkit.org/methods

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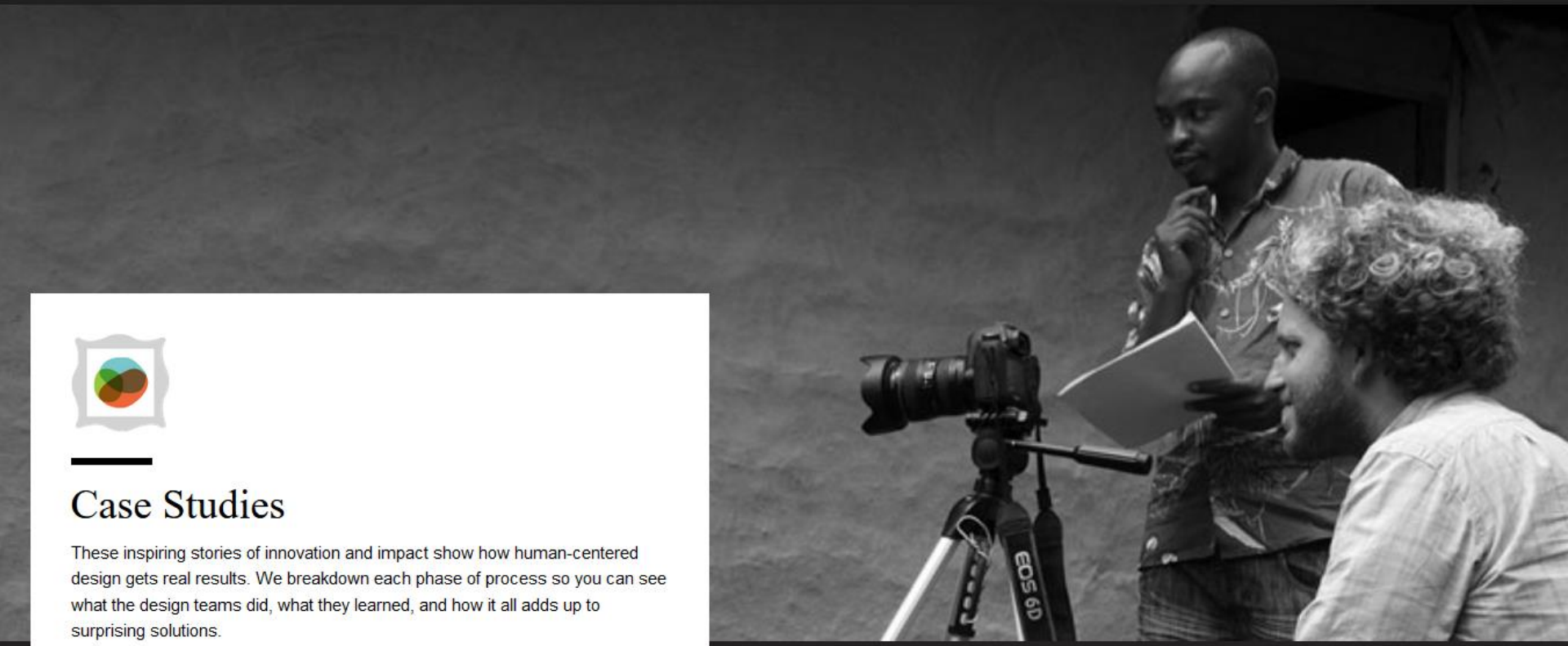
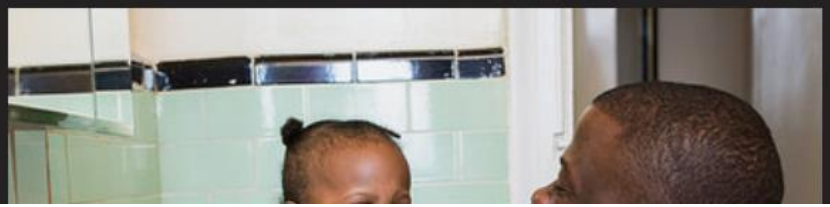


Case Studies

These inspiring stories of innovation and impact show how human-centered design gets real results. We breakdown each phase of process so you can see what the design teams did, what they learned, and how it all adds up to surprising solutions.



https://www.designkit.org/case-studies

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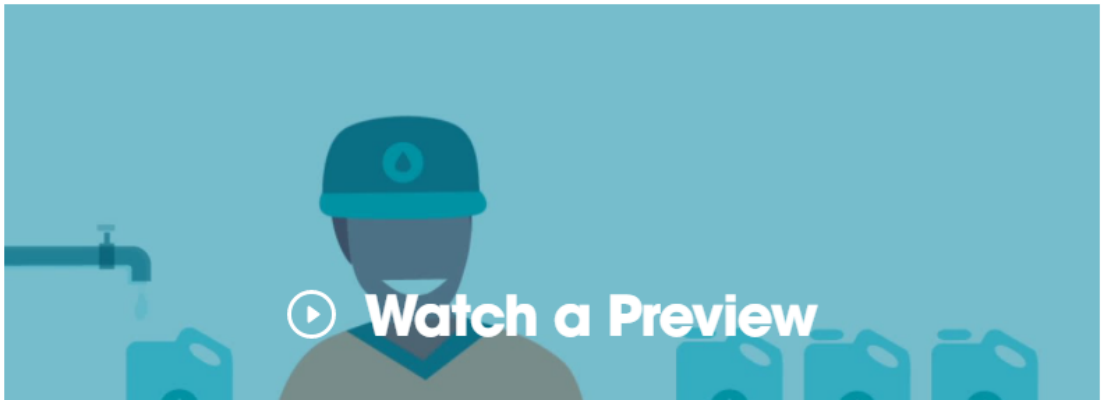
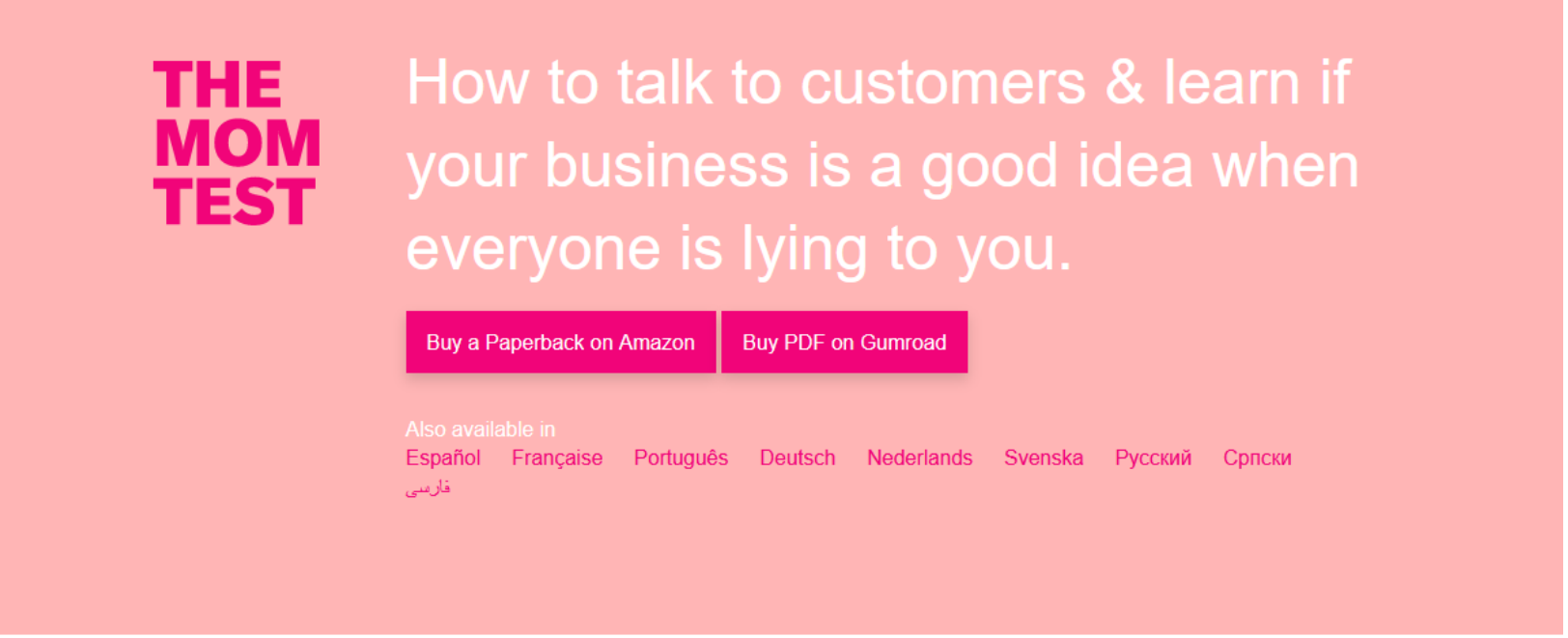


https://acumenacademy.org/course/design-kit-human-centered-design/



THE BOOK

The Mom Test

Buy Paperback on Amazon

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The quick and easy handbook about how to get more learning and more sales out of your customer conversations. Even when everyone is lying to you.

Stop wasting your time

Entrepreneurs are universally busy, yet odds are high that you're wasting huge amounts of time sitting in pointless meetings and building unnecessary features. Take two hours to read this book and you'll see it repaid tenfold.

★★★★★

4.7/5 stars on Amazon

Practical, not academic

The world doesn't need another framework or theory. The Mom Test skips all that and gets to the hands-on challenges. How to avoid biased feedback? How to write an email that makes people want to talk to you? How to figure out whether someone is really going to buy? It's all in here.

★★★★½

4.4/5 stars on Goodreads

http://momtestbook.com/

The Little Book of Design Research Ethics

https://www.ideo.com/post/the-little-book-of-design-research-ethics

Andrew Burroughs

Adjunct Lecturer

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Andrew is an expert practitioner of Design Thinking, with 30 years of experience. He has lead teams in the design of consumer products, award-winning healthcare delivery devices and new services, including a kidney transporter (now in the MOMA collection), Eli Lilly's first insulin pen for the US market and a ground-breaking powered surgical tool for Smith & Nephew. At IDEO for 25 years, he led the Chicago office and was named Partner in 2007. Andrew published Everyday Engineering: What Engineers See, a book that gives a glimpse of the world through the eyes of an engineer. Driven by his passion for sustainability and the environment, Andrew has led the design of several energy-related service design projects, including a pilot with Consumers Energy in Flint, MI, that led to the redesign of the energy experience around low-income customers, resulting in more on-time payments and significantly lower energy consumption for program participants. His work has been recognized with several awards, including the IDEA Gold Award from the Industrial Design Society of America (IDSA), the IDSA Design of the Decade Silver Award, and Silver and Gold Medical Design Excellence Awards. He holds more than 20 patents. Andrew sits on the board of the Delta Institute in Chicago.

Andrew is an Adjunct Professor at Northwestern University's Segal Design Institute, where he lectures on design research in the MMM program. Andrew also works at Healthy Minds Innovations in Madison, WI focusing on the confluence of neuroscience and meditation.

He holds a Master's degree in Industrial Design Engineering from the Royal College of Art and a Bachelor's degree in Mechanical Engineering from Imperial College London.

https://design.northwestern.edu/people/profiles/burroughs-andrew.html

Implementing Human Centered Design Research

Andrew Burroughs

Ethos 2022

Andrew Burroughs

30 years as a Mechanical Design Engineer, with a focus on consumer and medical products and energy services. Adjunct professor at Northwestern.

Currently at contemplative neuroscience company Healthy Minds Innovations, Madison, WI developing a digital wellbeing service for organizations.

Disclaimer

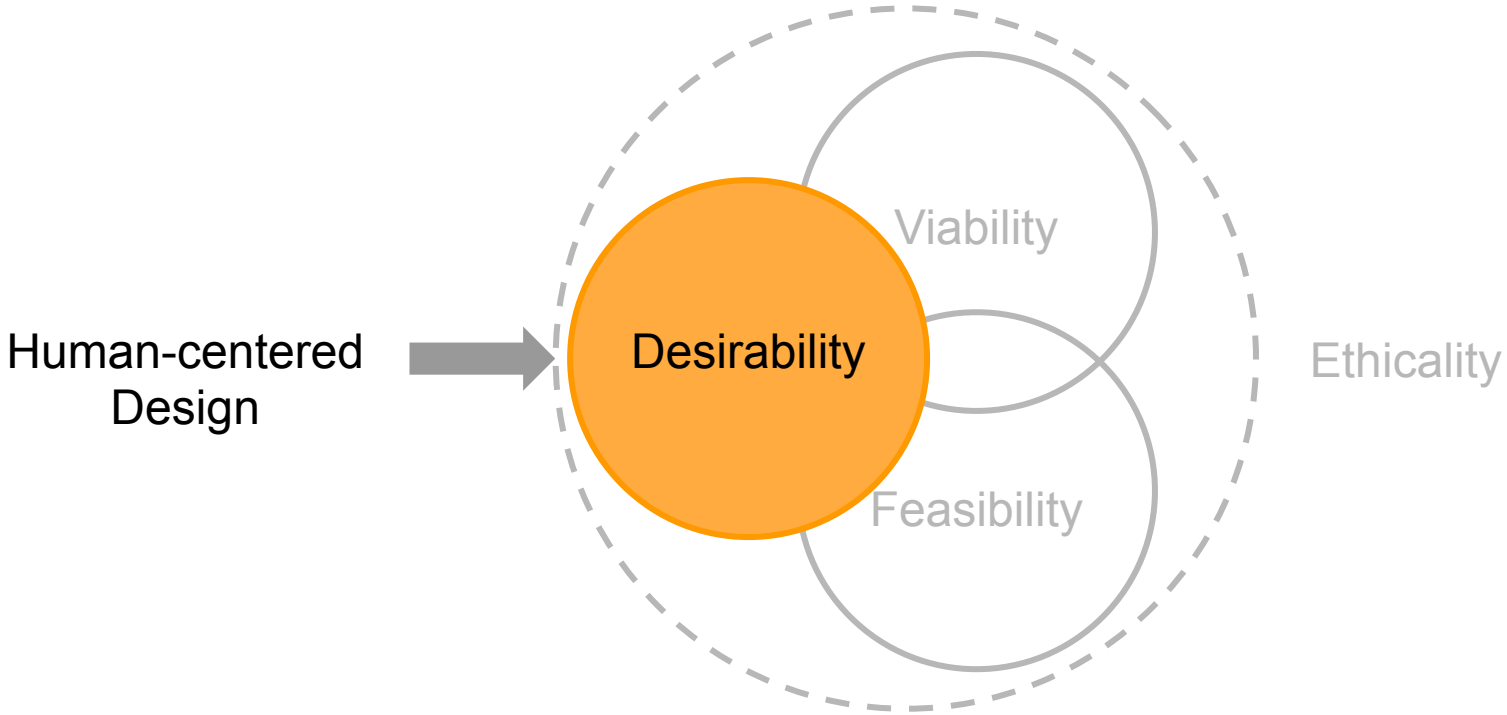
Let’s begin

Problem solvers love good problems…

This talk should help you understand how to find good problems that are worth solving. I have no doubt that the ingenuity in the ‘room’ here is almost limitless… but, where to apply it?

Enter >> Human Centered Design Research

Human Centered Design



As a (Human Centered) Designer, you need to know *who* you are designing for.

That makes you also a User Researcher.

You will need to use your creativity to develop new approaches to research and to craft important project components for yourself and your team.

Our focus today

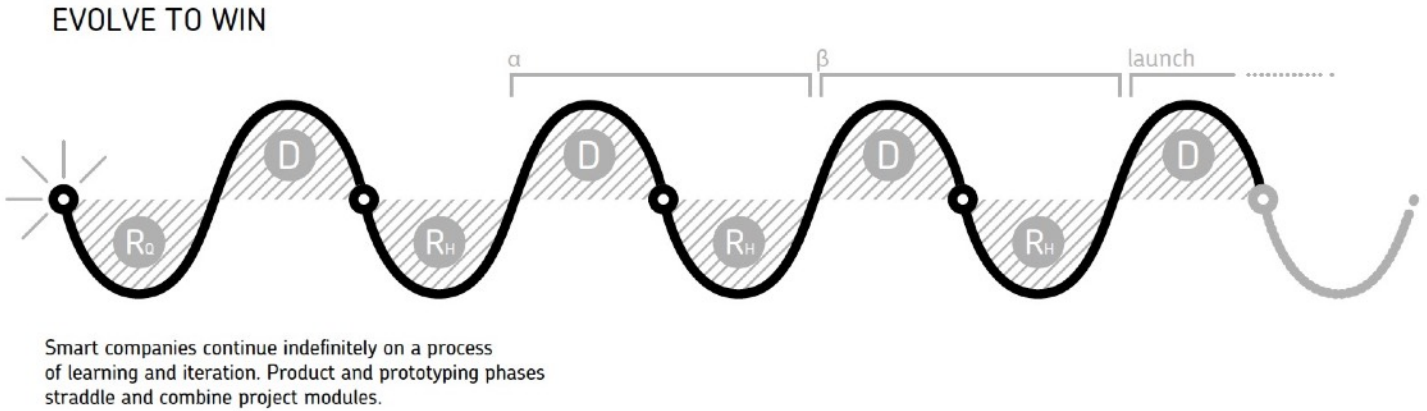
- Trusting your research eyes and ears
- The value of context in providing tangibility and cueing conversation
- Designing creative research stimuli to foster conversation
- Understanding how to find insights with design energy
- Turning insights into actionable “HMW” problems to tackle


Deli
climate controlled
AAA
Costco

Research approaches

Project phase:	**Strategize**	**Execute**	**Assess**
Goal	Inspire, explore and choose new directions and opportunities	Inform and optimize designs in order to reduce risk and improve usability	Measure product performance against itself or competition
Approach	Qualitative and quantitative	Mainly qualitative (Formative)	Mainly quantitative (Summative)
Typical Methods	Field studies, diary studies, data mining or analytics	Card sorting, field studies, participatory design, paper prototype, usability studies, desirability studies, customer emails	Usability benchmarking, online assessments, surveys, A/B testing

User Research should be continuous, iterative, and tightly coupled with design.

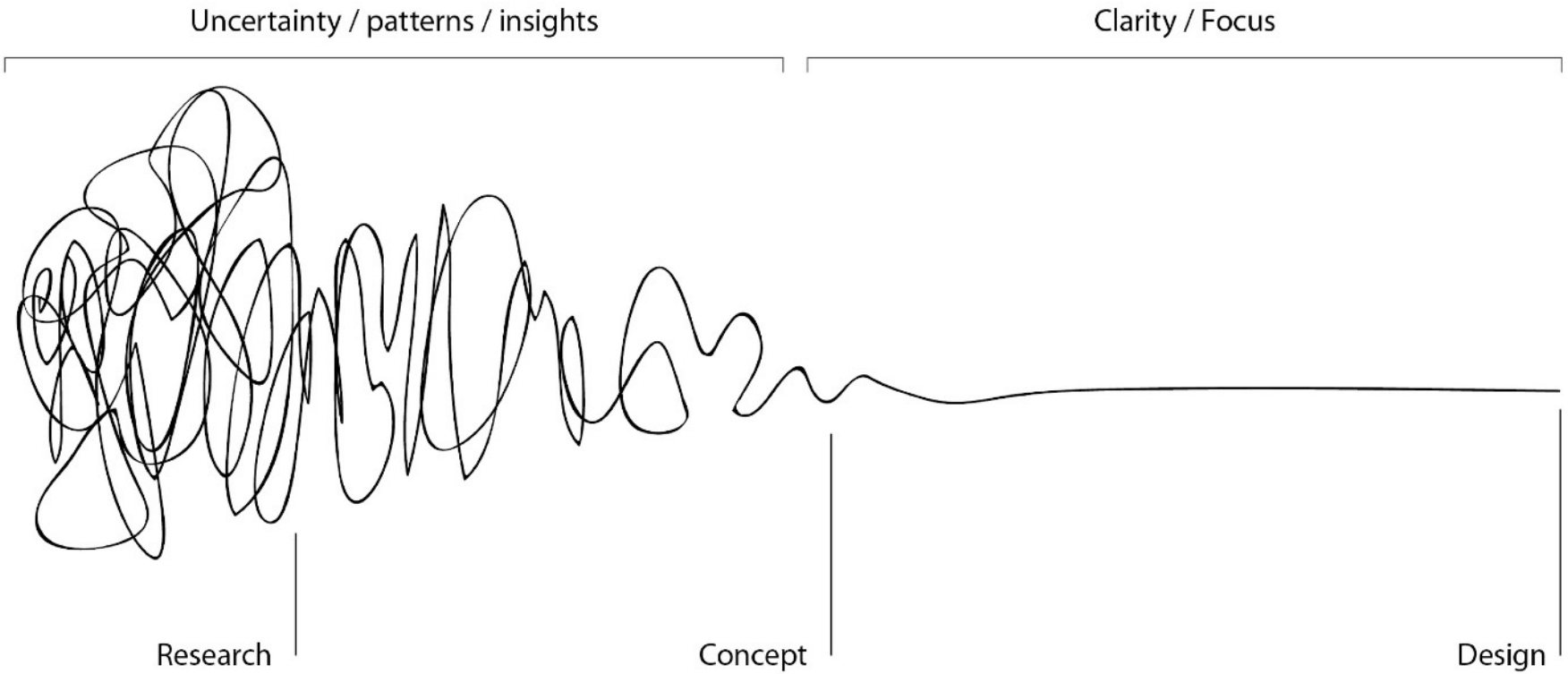


Just as your prototypes evolve in fidelity, your research evolves in its level of focus across the project.

- Early design research is exploratory, open, and broad. You cast a wide net.

- Later design research is more focused and oriented around design specifics.

What HCD feels like



Exploratory

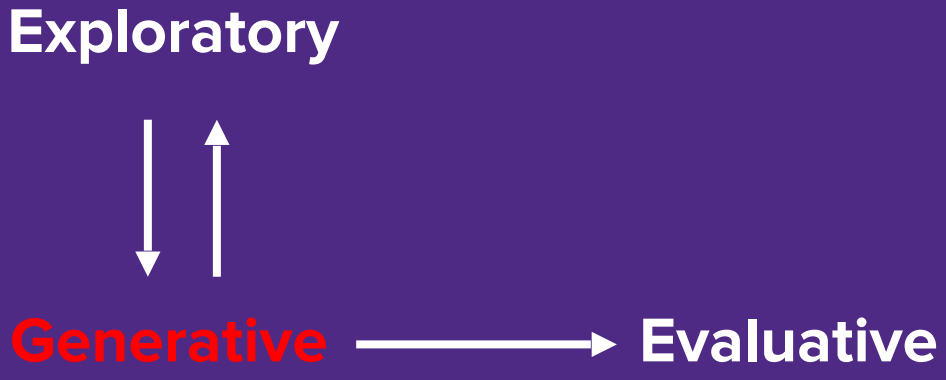
Generative ⟶ Evaluative

EXPLORATORY: Start with the questions you want to address (not the research methods).

What are <u>unmet needs</u> in this domain? Where is there a problem for people that I can solve with design?

Where are things working OK for people that I can amplify with great design?

Example: Living with hemophilia


Exploratory
Generative
Evaluative

GENERATIVE: Use the hypotheses you want to explore at this point in the HCD process.

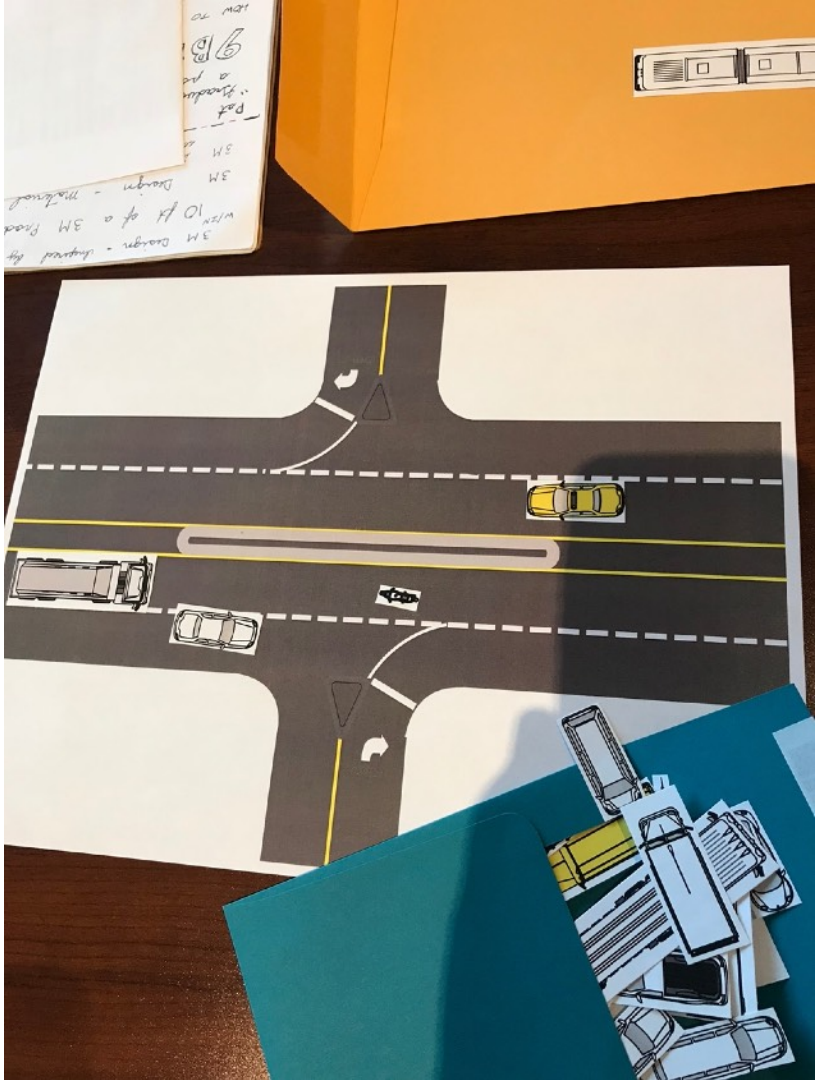
Once you have some initial hypotheses, create research stimuli* to dive deeper into possible opportunity areas.

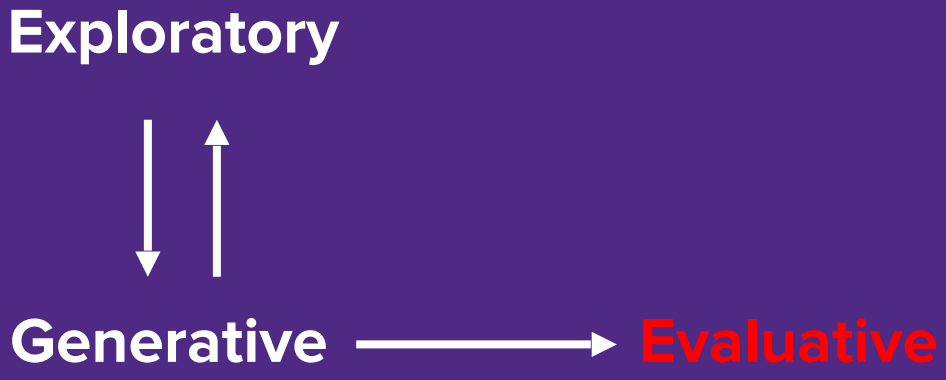
****These are different from early concepts.***

Research Stimuli

Colorforms to illustrate relationships between things in a setting or context.

“Show me your most dangerous situation as a cyclist in traffic.”




Exploratory
Generative
Evaluative

EVALUATIVE: Compare and validate concepts against the identified problem to be solved.

What are the advantages and disadvantages of concept A over concept B?

How do people react when they experience the actual trade-offs required in a design?

Does this design solve for the unmet need we tried to address?

Retail pharmacy environment

Why do we care?

Why do we care about design research?

One answer is because innovation is difficult. We are trying to solve new and tough problems. We need to look at the world with fresh eyes and in particular, through our users eyes.

Users are our experts, not designers

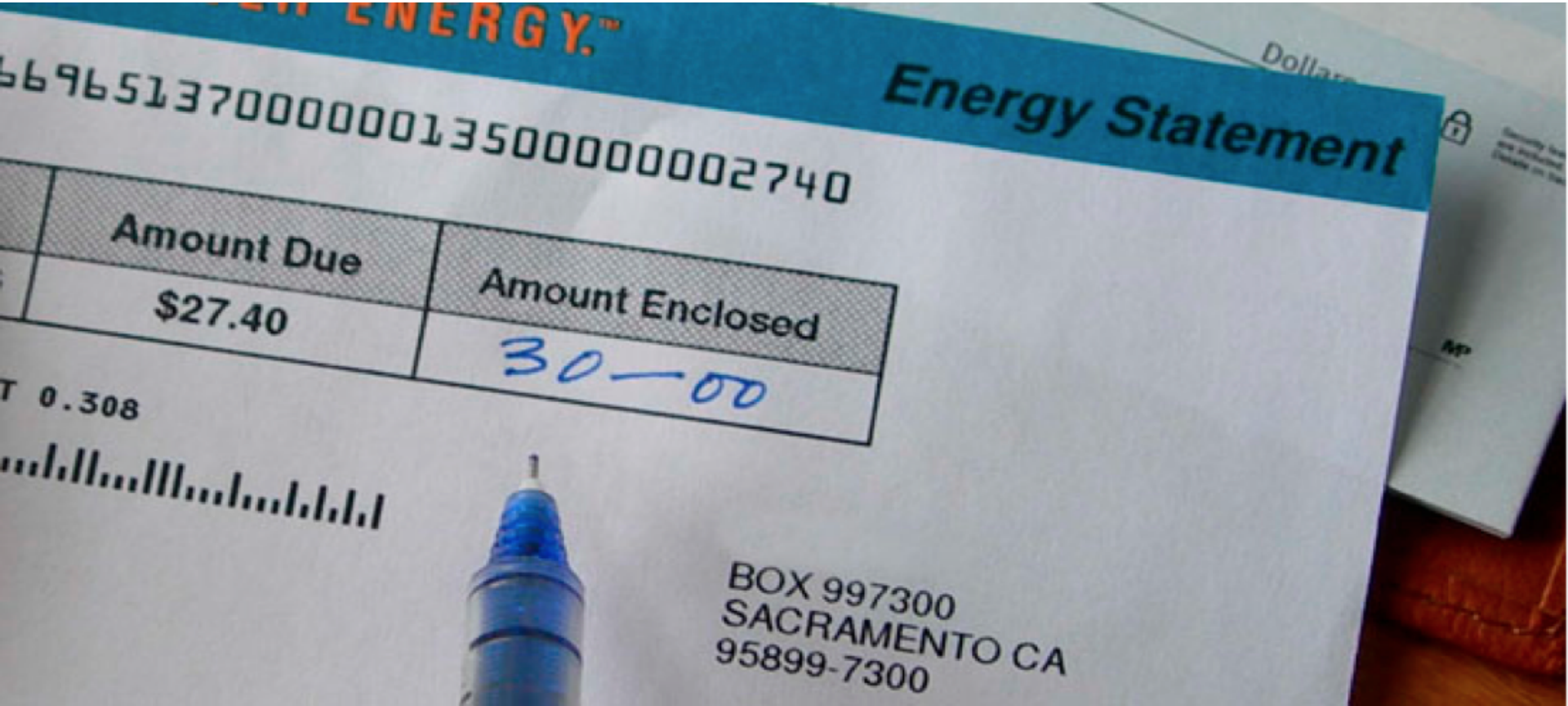
(a quick story...)


The purpose of design research is to fuel human-centered design innovation

We are looking for insights, that lead easily to new solvable problems...

...insights that have “design energy”

Rounding up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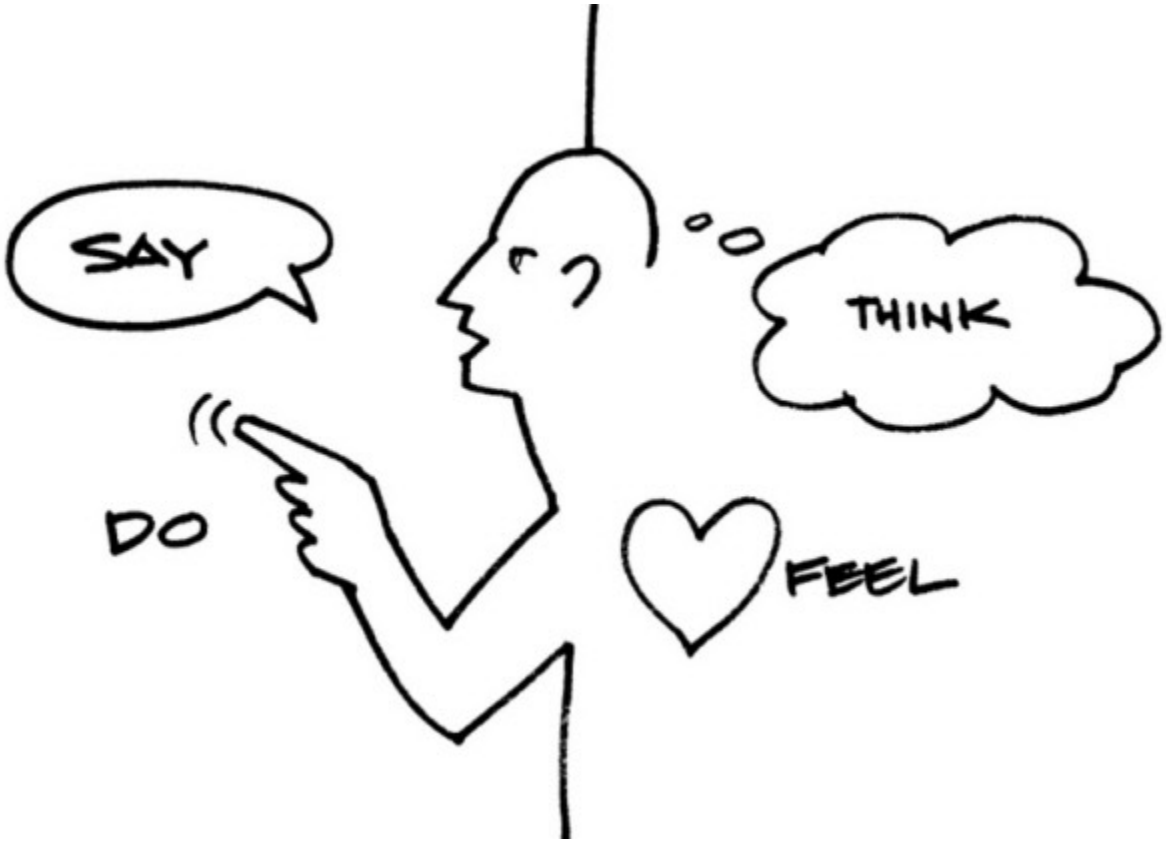
Role of the minivan in a family experience

Living Room on Wheels ad campaign

Why isn’t this easy?


SAY
THINK
DO
FEEL

“This bottle would be easy for me to open.”

How to proceed

Research Assets

You should arm yourself with a bunch of assets:

Research Plan

- Initial hypotheses
- Identified stakeholders
- Extreme users
- Frameworks to guide you
- Analogous observations
- Research methods
- Research stimuli

Discussion Guide

- Topics of exploration
- Exploratory mindset open to unexpected areas of design energy

First, zoom out – open up the problem. Start wide so as not to miss an opportunity.

If it's a...

- **journey, what are the journey stages?**
- **process, what are the process stages?**
- **context, what is the larger context?**

Create a Design Research Plan (5Ws)

WHO	Who are the users and other stakeholders relevant to the problem? Consider who might be “extreme users”
WHAT	What are the key issues you want to try to gain insight into? What your pre-existing hypotheses and potential biases? Consider what might be analogous inspiration
WHERE	What contexts are important for you to visit? to observe and use your radical looking skills to use the context to cue user stories to have people be able to show you
WHEN	Are there certain days or time periods when you will see certain rituals or important behaviors?
WHY	Be able to articulate your hypotheses that drive the plan
HOW	What methods will you use get at this understanding and maximize your chances of finding insights with design energy? What research stimuli will you create for the conversation?

What hypotheses are you starting with?

- Articulate your early hypotheses
  - You need these to plan the research, but you need to be open to being wrong. **STRONG HYPOTHESES, WEAKLY HELD**
  - New hypotheses will come out of each wave of research and you adapt what you do in the next research wave accordingly

    At this stage, nothing is precious!

Could some analogous research help?

Race Car pit crews have a lot in common with OR teams

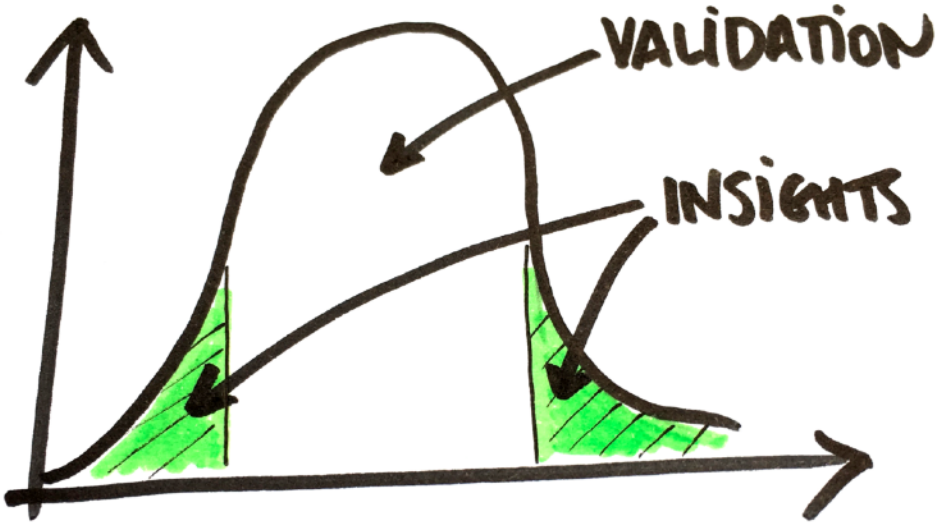
- Safety, speed, and efficiency are paramount
- Things are kitted, a lot of backup duplicates
- Intense team work with specific team roles

Theater costume change

Rock climbing

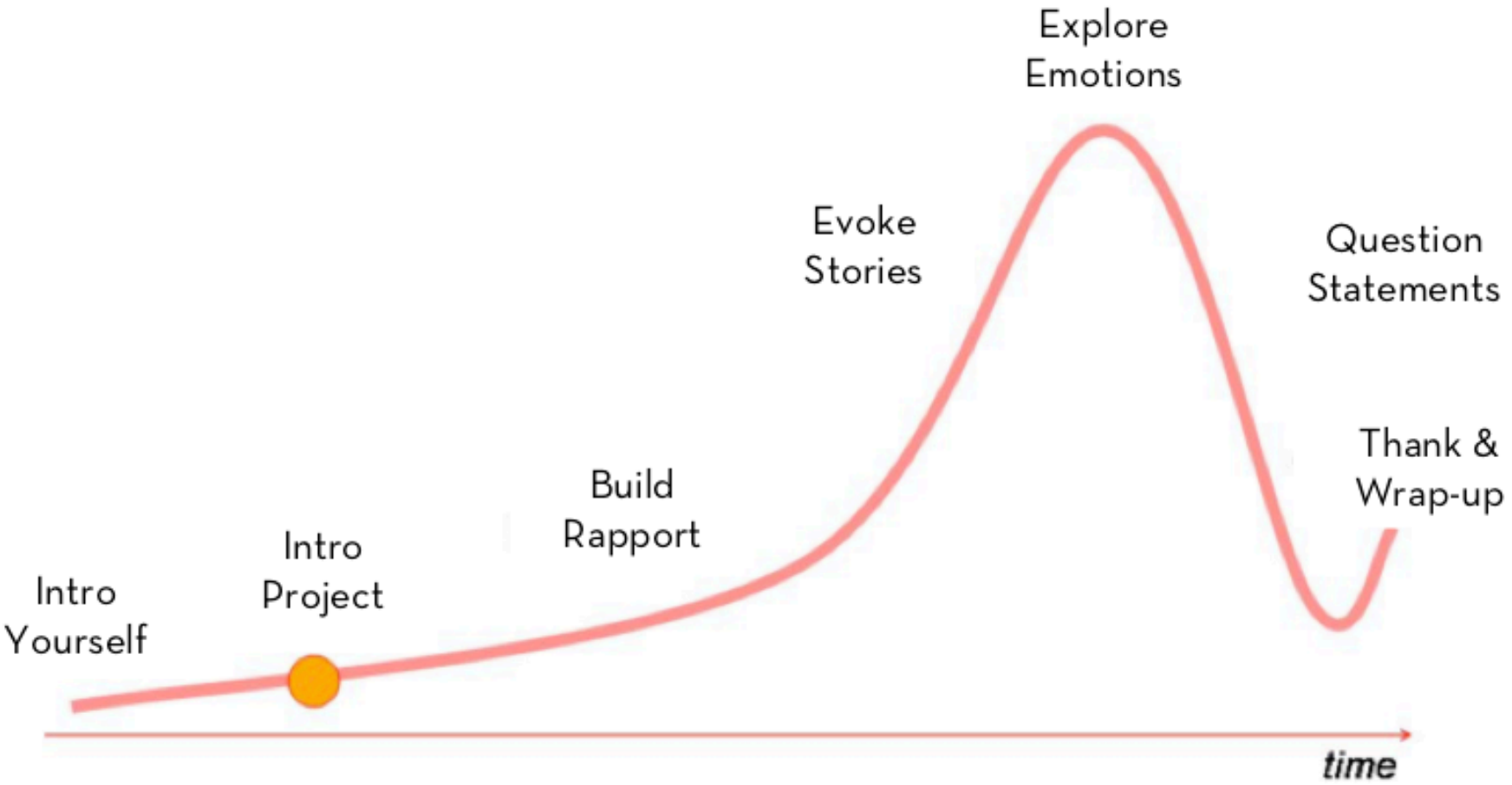
Don’t just focus on your core users

Extreme Users



Some other basics, like, er...

how do you talk to people?



Visual adapted from Michael Barry, Point Forward

Research Stimuli can help you extend the conversation beyond the obvious into the areas you want to explore with your design

Some forms of research stimuli

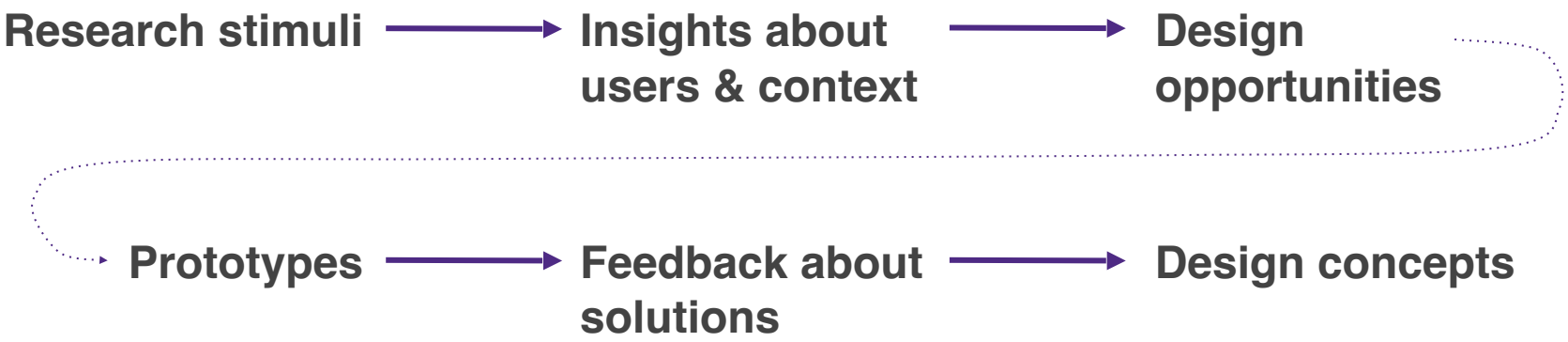
Research stimuli are designed to focus the exploration on your topics of interest and foster the conversation in interesting ways that go beyond simply asking questions.

- Existing Things
- Panel Comic
- Drawing Exercises
- Framework Exercises
- Storyboards
- Heroes and Villains Narrative
- Colorforms
- Orthogonal Design Exercises
- Card Sorts
- Role Playing
- Evocative Images
- *Sacrificial concepts*

Research Stimuli are NOT concepts. They are designed to probe the problem and then be tossed aside.

To explore the full breadth of a problem, you need to move quickly to cover a lot of territory – don’t waste time on precision at this stage.

How do research stimuli differ from prototypes?

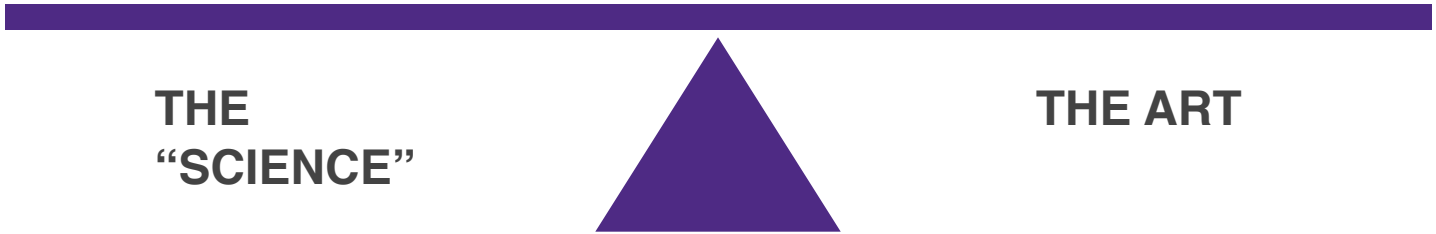


Processing your research findings

Synthesis

- Look for buckets and themes
- Consider the relationships between themes
- Group/re-group
- Compare notes
- Have each team member articulate 3 key findings at regular intervals

WHERE DOES YOUR INTUITION TELL YOU THERE IS DESIGN ENERGY?



Four basic steps

I Tell stories

II Look for patterns and themes

III Identify insights with design energy

IV Communicate the insights

Patterns and Themes

What themes run across your stories?

Focus on emotional, not just functional

Look for tensions and contradictions

Try both bottom up and top down clustering of your observations

Iconic images

a picture can really be worth 1000 words - and an N of 1000

the right image can be quite memorable and sticky

SUN LIGHT GEL

Hefty

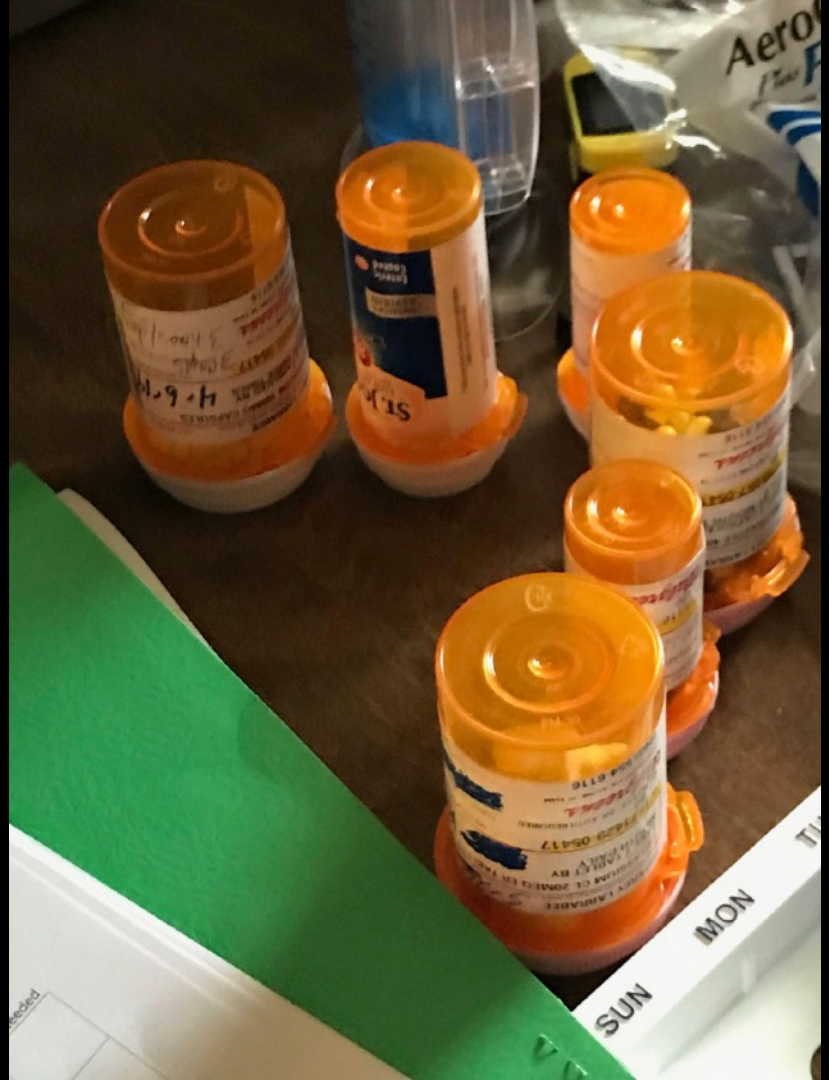
CinchSak

Tall Kitchen Bags


BROTHER


Consumers Energy
METER SOCKETS
CUSTOMER SERVICES


Consumers Energy
Customer Service
Bill Payment
Mon - Fri
9:00 am - 4:30 pm
PULL


SUN
MON

Moving from Insights to HMWs

tensions are building blocks for design solutions

stories help steer you

Step 1:

Articulate the users, their needs and goals, and high level challenges…

which become your high level INSIGHTS

USER NEED

As a _____, I want/need _____ , so that _____.

User Type | User Need | User Goal

USER PROBLEM

_____ is challenging for _____ because _____.

Situation | User Type | Cause/Problem

USER NEED

As a _____, I want/need _____ , so that _____.
User Type **User Need** **User Goal**

USER PROBLEM

_____ is challenging for _____ because _____.
Situation **User Type** **Cause/Problem**

As a **caregiver**, I want/need **to feel my elderly loved one is safe in their home** so that **I have peace of mind when I am not there.**

INSIGHT: Falls are challenging for **both of us** because **they often lead to hospitalization and a cascade of problems which start a downward spiral in health, mobility, and fearfulness for my loved one.**

Step 2:

Articulate more specific TENSIONS for each insight to move you towards design ideas

TENSION: Reducing clutter and eliminating fall risks (e.g., credenza that juts out) could prevent falls **BUT** older people are reluctant to part with things - especially things with emotional significance.

TENSION: Leaving the controlled environment of the home exposes people to a variety of fall risks (uneven pavement, purses hung on chairs in restaurants), **BUT** experiences outside the home provide physical, cognitive, emotional, and social benefits for an older adult.

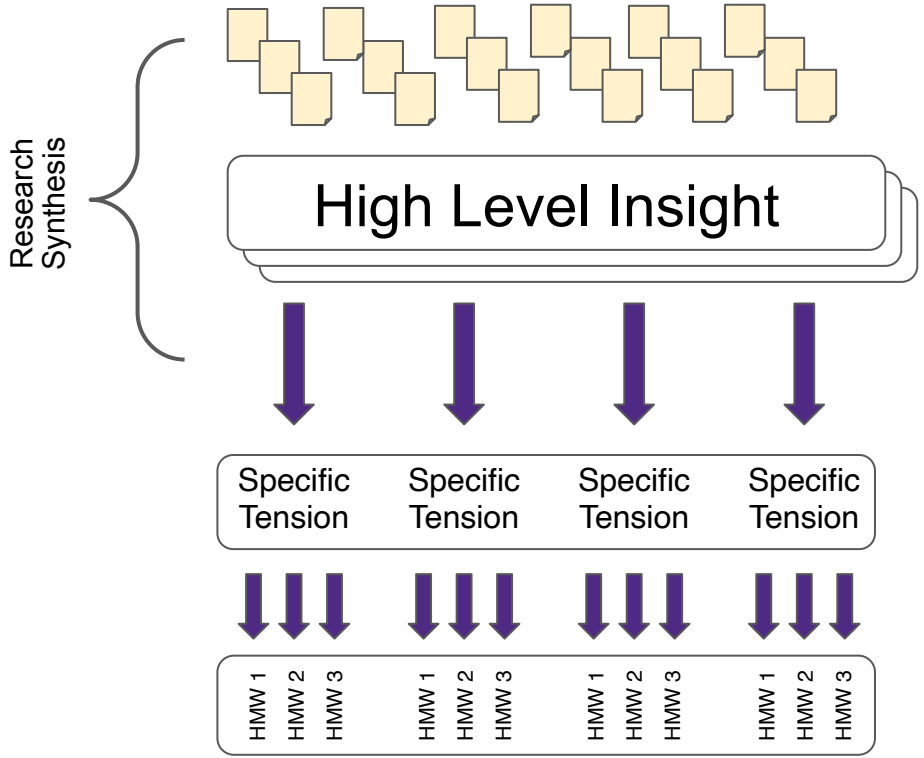
TENSION: Assistive aids to prevent falls exist (e.g., rollators) **BUT** they make people feel old and are often aesthetically unpleasing.

Step 3:

TENSIONS lead directly to interesting problems to solve. How Might We (HMW) balance two competing conditions.

The essence of design is artful compromise.

From Insights to HMWs



These are your observations

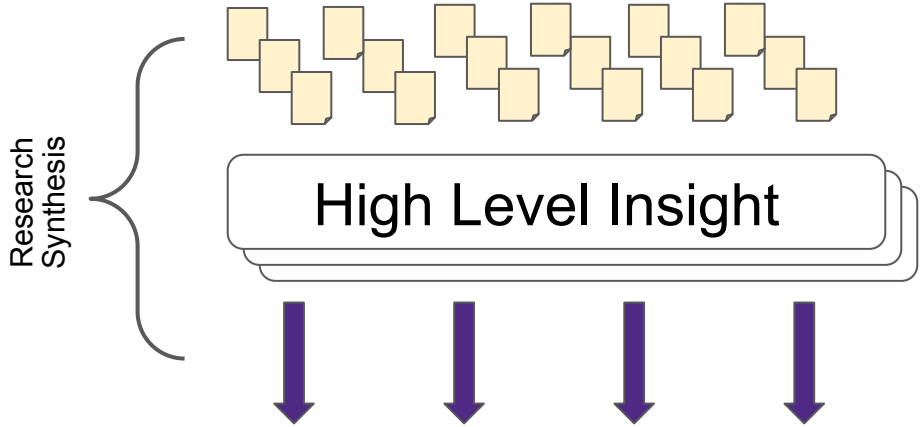
Leading to multiple research insights

These are your tensions from each insight

These are your brainstorm prompts for each specific tension

From Insights to HMWs

Step 1



These are your observations

Leading to multiple research insights [You can't solve these with design]

Step 2

Specific Tension | Specific Tension | Specific Tension | Specific Tension

These are your tensions from each insight

Step 3

HMW 1 HMW 2 HMW 3 | HMW 1 HMW 2 HMW 3 | HMW 1 HMW 2 HMW 3 | HMW 1 HMW 2 HMW 3

These are your brainstorm prompts for each specific tension [These are readily solvable with design]

HMWs

HMW design more aesthetically pleasing assistive aids?

HMW design assistive aids that do not connote “old age”?

HMW design assistive aids that are more invisible to others?

HMW imbue assistive aids with positive emotive stories?

Thank you

Any questions?

burroughs.andrew.c@gmail.com

Appendix:
Tools & Frameworks

Research approaches

Project phase:	**Strategize**	**Execute**	**Assess**
Goal	Inspire, explore and choose new directions and opportunities	Inform and optimize designs in order to reduce risk and improve usability	Measure product performance against itself or competition
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WHY	Be able to articulate your hypotheses that drive the plan
HOW	What methods will you use get at this understanding and maximize your chances of finding insights with design energy? What research stimuli will you create for the conversation?

Try using the AEIOU framework

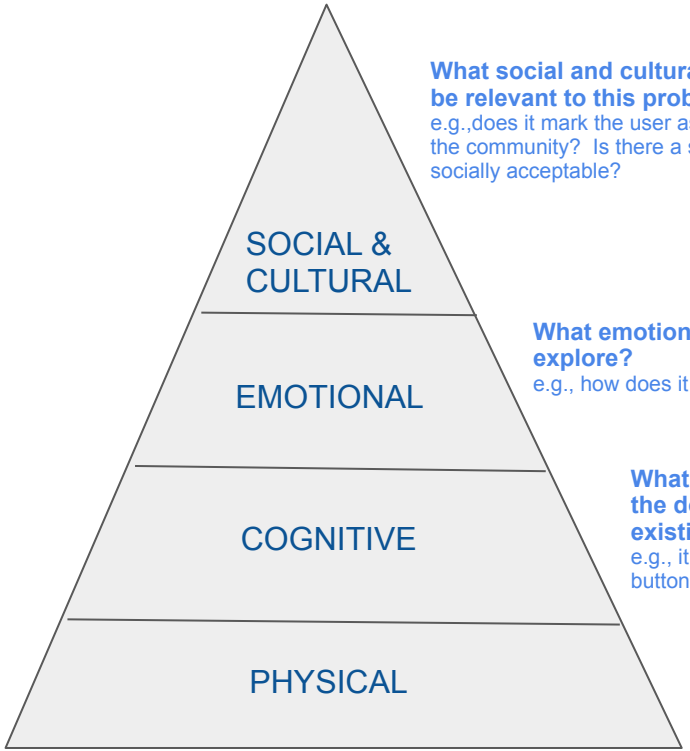
OBSERVATION WORKSHEET
AEIOU FRAMEWORK

Activities What are people doing?	
Environment How are people using the environment? What's the role of the environment?	
Interactions Do you see any routines? Do you observe special interactions between people? Between people and objects?	
Objects What's there and being used or not used? Describe engagement with objects? Are there any work-arounds you can identify?	
Users Who are the users you are observing? What are their roles? Are there any extreme users?	

Now think about any insights that come out of your observations. Remember, an insight is not an idea; it's a statement that drives your idea and identifies the needs of users.

Human Hierarchy of Needs

based on Maslow, A.H. (1943). A theory of human motivation. *Psychological Review*. **50** (4): 370–96.

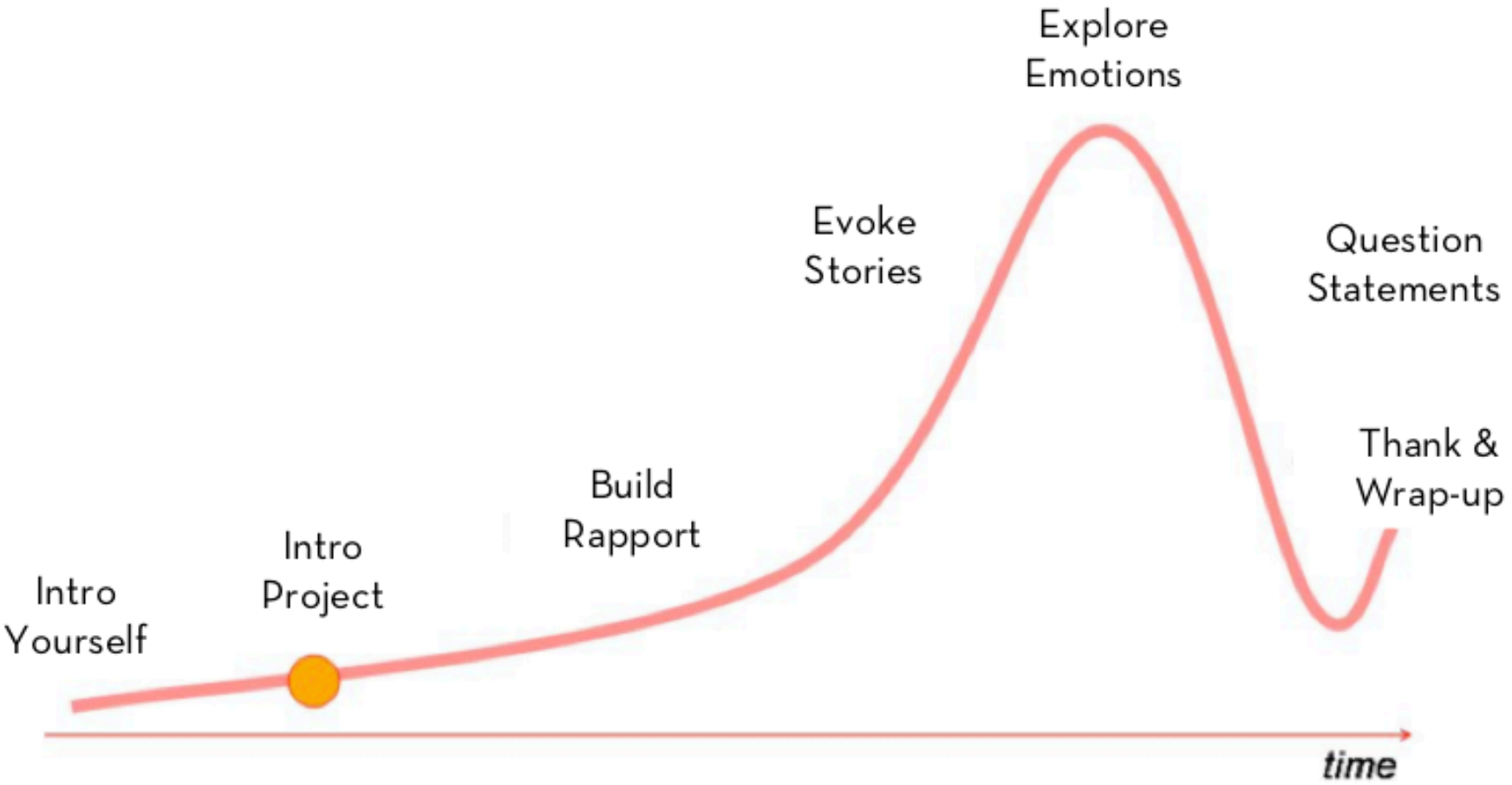


What social and cultural norms might be relevant to this problem area?
e.g.,does it mark the user as "old" to the rest of the community? Is there a stigma or is it socially acceptable?

What emotional issues do you want to explore?
e.g., how does it make me feel to wear this?

What makes something easy to understand or confusing in the domain you are exploring? Can you hook into an existing mental model?
e.g., it is clear when to use this and what happens when you press the button? What feedback do you get that you actually pressed the button?

Ergonomics. What will be relevant to consider about the user physically interacting with the product?
e.g., is the button pressure optimal for this older user?



Visual adapted from Michael Barry, Point Forward

HOW to interview

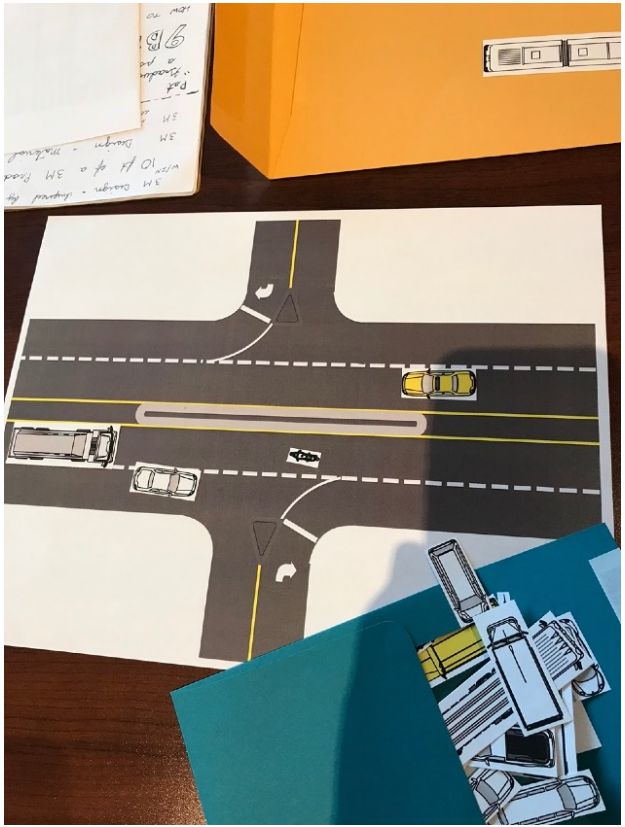
Ask why. Even when you think you know the answer, ask people why they do or say things. The answers will sometimes surprise you. A conversation started from one question should go on as long as it needs to.
Never say "usually" when asking a question. Instead, ask about a specific instance or occurrence, such as "tell me about the last time you ___"
Encourage stories. Whether or not the stories people tell are true, they reveal how they think about the world. Ask questions that get people telling stories.
Look for inconsistencies. Sometimes what people say and what they do are different. These inconsistencies often hide interesting insights.
Pay attention to nonverbal cues. Be aware of body language and emotions.
Don't be afraid of silence. Interviewers often feel the need to ask another question when there is a pause. If you allow for silence, a person can reflect on what they've just said and may reveal something deeper.
Don't suggest answers to your questions. Even if they pause before answering, don't help them by suggesting an answer. This can unintentionally get people to say things that agree with your expectations.
Ask questions neutrally. "What do you think about buying gifts for your spouse?" is a better question than "Don't you think shopping is great?" because the first question doesn't imply that there is a right answer.
Don't ask binary questions. Binary questions can be answered in a word; you want to host a conversation built upon stories.
Make sure you're prepared to capture. Always interview in pairs. If this is not possible, you should use a voice recorder—it is impossible to properly engage a user and take detailed notes at the same time.

Some forms of research stimuli

Research stimuli are designed to focus the exploration on your topics of interest and foster the conversation in interesting ways that go beyond simply asking questions.

- Existing Things
- Panel Comic
- Drawing Exercises
- Framework Exercises
- Storyboards
- Heroes and Villains Narrative
- Colorforms
- Orthogonal Design Exercises
- Card Sorts
- Role Playing
- Evocative Images
- *Sacrificial concepts*

Colorforms



Colorforms to illustrate relationships between things in a setting or context.

“Show me your most dangerous situation as a cyclist in traffic.”

Orthogonal Design Exercises

Asked people to design a new police uniform to understand how police could better serve people with severe mental illnesses in the public health system.

Card Sorts

Pick a few - what matters most to you?

Example: project was about engagement with a professional organization for doctors

Card Sort (30 mins)
I have about 20 cards here. Each one has a dimension that could be important for a physician to experience joy in their job. I'd like you to read each card and then pick 5 or so that describe what matters to you.

Think aspirational rather than rational. Imagine that time, money, and healthcare reform don't matter right now. Then we'll talk about each card you chose.

Role Playing

Imagine you are looking for a new roommate. Play the role of an applicant you are interviewing who you do not feel safe with.

I'll play you.

- Tell me a little about yourself
- What do you like to do for fun?
- What are you looking for in a roommate situation?

Do this roleplaying 2x

1. Make it obvious
2. Make it subtle

Evocative Images

“Tell me a story about this picture.”

Used to talk with adult children caregivers about “taking away” the car keys from their elderly parents

USER NEED

As a _____, I want/need _____ , so that _____.

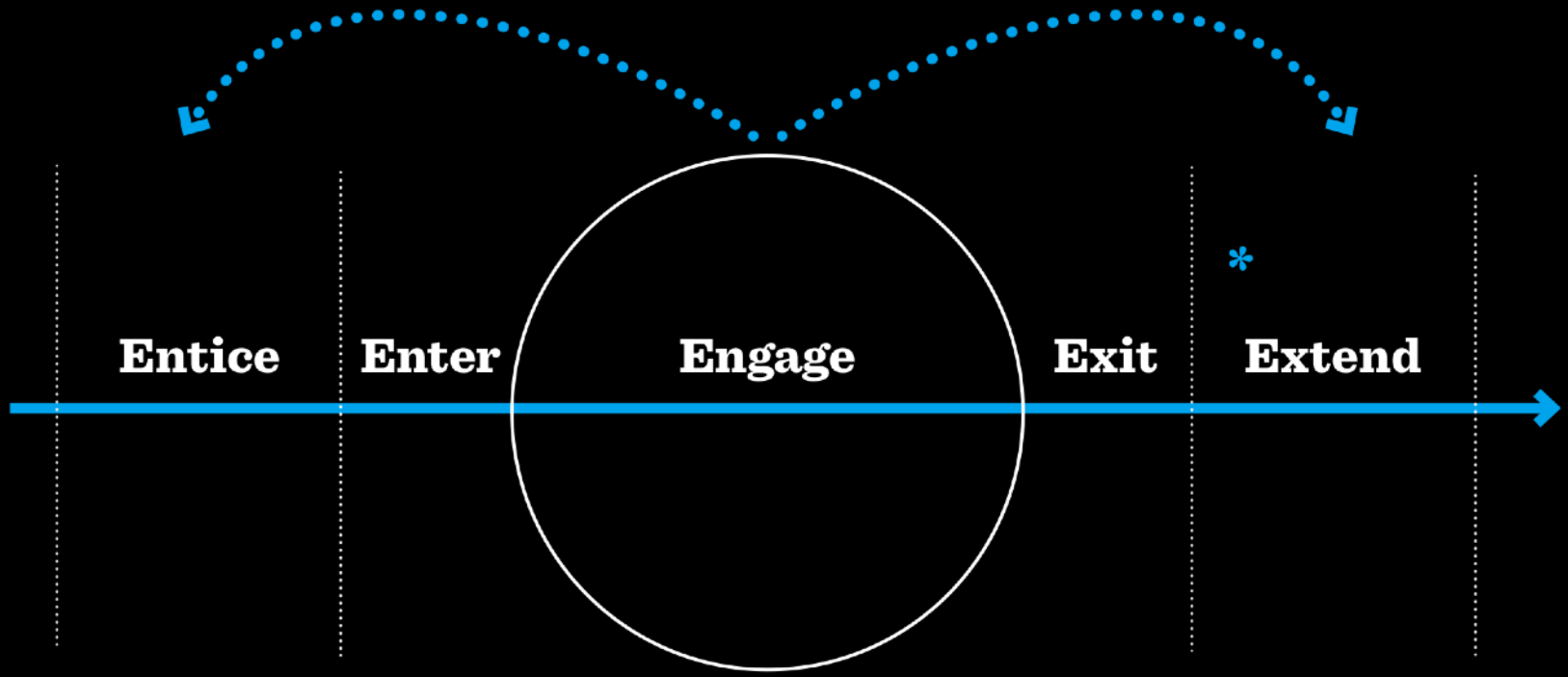
User Type | User Need | User Goal

USER PROBLEM

_____ is challenging for _____ because _____.

Situation | User Type | Cause/Problem

Experience Model: **5Es**



Maternity Journey Map